

LISTING OF THE CLAIMS

The following listing, if entered, replaces all prior versions of the claims in the present application.

1. **(Currently Amended)** A method comprising:
detecting a failure of a first link, wherein
said first link is coupled between a first port of a network element and an
upstream portion of a communications network, **and**
said first link comprises a first part of a communications channel between
said upstream portion of said communications network and a
downstream portion of said communications network, **and**
said first port is associated with a virtual network;
in response to said detecting said failure of said first link,
disabling identifying a second port of said network element **that is**
associated with said virtual network, wherein
a second link is coupled between said second port of said network
element and said downstream portion of said
communications network, and
said second link comprises a second part of said communications
channel, **and**
disabling said second port of said network element;
in response to detecting a recovery of said first link, re-enabling said second port
of said network element; and
in response to said re-enabling said second port, said communications channel
failing back to said first link and said second link.
2. **(Original)** The method of claim 1, wherein
said downstream portion of said communications network comprises a
redundantly-linked network element.

3. (Original) The method of claim 2, wherein
said redundantly-linked network element comprises a protocol stack including a
first protocol stack layer and a second protocol stack layer,
said first protocol stack layer is associated with one or more applications, and
said disabling comprises notifying said second protocol stack layer of said failure.
4. (Original) The method of claim 3, wherein
said network element comprises a primary network element,
said method further comprises enabling a third link between said redundantly-
linked network element and a secondary network element, and
said secondary network element is coupled to said upstream portion of said
communications network using a fourth link.
5. (Original) The method of claim 2, wherein said redundantly-linked network
element comprises a multi-homed endstation.
6. (Original) The method of claim 2, wherein said network element comprises a
datalink layer network element.
7. (Previously Presented) The method of claim 1, wherein
said second port is not re-enabled, if said second port is configured to remain
disabled in response to said detecting said recovery of said first link.
8. (Original) The method of claim 2, wherein said upstream portion of said
communications network comprises a network layer network element.
9. (Previously Presented) The method of claim 1, wherein said disabling said
second port further comprises:
disabling a plurality of links between said network element and a plurality of
redundantly-linked network elements, wherein said downstream portion of
said communications network comprises said plurality of redundantly-
linked network elements.

10. (Previously Presented) The method of claim 1, wherein said disabling said second port further comprises:

disabling a link of a plurality of links between said network element and a plurality of redundantly-linked network elements, wherein said downstream portion of said communications network comprises said plurality of redundantly-linked network elements.

11.-12. (Cancelled)

13. (Previously Presented) The method of claim 1, wherein said disabling said second port further comprises:

disabling said second port of said network element within a period of time substantially less than or equal to 50 milliseconds of said detecting said failure of said first link.

14. (Previously Presented) The method of claim 1, wherein said disabling said second port further comprises:

disabling said second port of said network element within a period of time substantially less than or equal to 2 seconds of said detecting said failure of said first link.

15. (Currently Amended) ~~An apparatus~~ A network element comprising:

a processor; and

a memory coupled to said processor, said memory storing instructions

executable by said processor to implement:

a link failure propagation module, configured to:

~~means for detecting~~ detect a failure of a first link, wherein

said first link is coupled between a first port of ~~[[a]]~~ said

network element and an upstream portion of a

communications network, ~~and~~

said first link comprises a first part of a communications channel between said upstream portion of said communications network and a downstream portion of said communications network, and
said first port is associated with a virtual network;
~~means for detecting a recovery of said first link;~~
~~means for disabling~~
in response to a detection of said failure of said first link,
identify a second port of said network element that is
associated with said virtual network, in response
~~to said means for detecting said failure of said~~
~~first link,~~ wherein
a second link is coupled between said second port of said network element and said downstream portion of said communications network, and
said second link comprises a second part of said communications channel, and
disable said second port of said network element;
~~means for re-enabling~~ re-enable said second port of said network element, in response to ~~said means for detecting said a~~
detection of a recovery of said first link; and
~~means for~~ cause said communications channel failing to fail back to said first link and said second link, in response to said
~~means for~~ re-enabling said second port.

16. (Currently Amended) The ~~apparatus~~ network element of claim 15, wherein said downstream portion of said communications network comprises a redundantly-linked network element.

17. (Currently Amended) The **apparatus network element** of claim 16, wherein
 said redundantly-linked network element comprises a protocol stack including a
 first protocol stack layer and a second protocol stack layer,
 said first protocol stack layer is associated with one or more applications, and
 said ~~means for disabling comprises means for notifying~~ **link failure**
 propagation module is further configured to notify said second
 protocol stack layer of said failure.
18. (Currently Amended) The **apparatus network element** of claim ~~[[17]]~~ **16**,
 wherein
 said network element comprises a primary network element,
 said ~~apparatus further comprises means for enabling~~ **redundantly-linked**
 network element is configured to enable a third link between said
 redundantly-linked network element and a secondary network element,
 and
 said secondary network element is coupled to said upstream portion of said
 communications network using a fourth link.
19. (Currently Amended) The **apparatus network element** of claim 16, wherein
 said redundantly-linked network element comprises a multi-homed endstation.
20. (Currently Amended) The **apparatus network element** of claim 15, wherein
 said ~~means for disabling said second port~~ **link failure propagation module is** further
~~comprises: means for disabling~~ **configured to**
 disable a link of a plurality of links between said network element and a plurality
 of redundantly-linked network elements, wherein said downstream portion
 of said communications network comprises said plurality of redundantly-
 linked network elements.
- 21.-22. (Cancelled)

23. (Currently Amended) The **apparatus network element** of claim 15, wherein said ~~means for disabling said second port~~ **link failure propagation module is** further ~~comprises: means for disabling configured to~~

disable said second port of said network element within a period of time substantially less than or equal to 50 milliseconds of said means for detecting said failure .

24. (Currently Amended) The **apparatus network element** of claim 15, wherein said ~~means for disabling said second port~~ **link failure propagation module is** further ~~comprises: means for disabling configured to~~

disable said second port of said network element within a period of time substantially less than or equal to 2 seconds of said means for detecting said failure.

25. (Currently Amended) A machine-readable non-transitory storage medium having a plurality of instructions executable by a machine embodied therein, wherein said plurality of instructions when executed cause said machine to perform a method comprising:

detecting a failure of a first link, wherein
 said first link is coupled between a first port of a network element and an upstream portion of a communications network, ~~and~~
 said first link comprises a first part of a communications channel between said upstream portion of said communications network and a downstream portion of said communications network, ~~and~~
said first port is associated with a virtual network;

in response to said detecting said failure of said first link,

~~disabling~~ **identifying** a second port of said network element **that is associated with said virtual network**, wherein
 a second link is coupled between said second port of said network element and said downstream portion of said communications network, and

said second link comprises a second part of said communications channel, **and**
disabling said second port of said network element; and
in response to detecting a recovery of said first link, re-enabling said second port of said network element; and
in response to said re-enabling said second port, said communications channel failing back to said first link and said second link.

26. (Previously Presented) The machine-readable non-transitory storage medium of claim 25, wherein
said downstream portion of said communications network comprises a redundantly-linked network element.
27. (Previously Presented) The machine-readable non-transitory storage medium of claim 26, wherein
said redundantly-linked network element comprises a protocol stack including a first protocol stack layer and a second protocol stack layer,
said first protocol stack layer is associated with one or more applications, and
said disabling comprises notifying said second protocol stack layer of said failure.
28. (Previously Presented) The machine-readable non-transitory storage medium of claim 27, wherein
said network element comprises a primary network element,
said method further comprises enabling a third link between said redundantly-linked network element and a secondary network element, and
said secondary network element is coupled to said upstream portion of said communications network using a fourth link.
29. (Previously Presented) The machine-readable non-transitory storage medium of claim 26, wherein said redundantly-linked network element comprises a multi-homed endstation.

30. (Previously Presented) The machine-readable non-transitory storage medium of claim 25, wherein said disabling said second port further comprises:

disabling a link of a plurality of links between said network element and a plurality of redundantly-linked network elements, wherein said downstream portion of said communications network comprises said plurality of redundantly-linked network elements.

31.-32. (Cancelled)

33. (Previously Presented) The machine-readable non-transitory storage medium of claim 25, wherein said disabling said second port further comprises:

disabling said second port of said network element within a period of time substantially less than or equal to 50 milliseconds of said detecting said failure of said first link.

34. (Previously Presented) The machine-readable non-transitory storage medium of claim 25, wherein said disabling said second port further comprises:

disabling said second port of said network element within a period of time substantially less than or equal to 2 seconds of said detecting said failure of said first link.

35. (**Currently Amended**) A data processing system comprising:

a redundantly-linked endstation; and

a network element configured to

detect a failure of a first link, wherein

said first link is coupled between a first port of said network element and an upstream portion of a communications network, **and**

said first link comprises a first part of a communications channel between said upstream portion of said communications network and said redundantly-linked endstation, **and**

said first port is associated with a virtual network,

in response to detection of said failure of said first link,
disable **identify** a second port of said network element **that is**
associated with said virtual network, wherein
a second link is coupled between said second port of said
network element and said redundantly-linked
endstation, and
said second link comprises a second part of said
communications channel, **and**
disable said second port of said network element,
in response to detection of a recovery of said first link, re-enable said
second port of said network element, and
in response to re-enabled said second port, fail back said communications
channel to said first link and said second link.

36. (Original) The data processing system of claim 35, wherein
said network element comprises a primary network element,
said redundantly-linked endstation is configured to enable a third link between
said redundantly-linked endstation and a secondary network element, and
said secondary network element is coupled to said upstream portion of said
communications network using a fourth link.
37. (Original) The data processing system of claim 35, wherein
said network element comprises an Ethernet switch.
38. **(Currently Amended)** A data processing system comprising:
a primary network element, wherein
a first port of said primary network element is coupled to an upstream
portion of a communications network using a first link,
a second port of said primary network element is coupled to a
redundantly-linked endstation using a second link,

said first link comprises a first part of a communications channel between
said upstream portion of said communications ~~channel network~~
and said redundantly-linked endstation,
said second link comprises a second part of said communications channel,
said first port is associated with a virtual network, and
said primary network element is configured to
detect a failure of said first link, ~~and~~
in response to detection of said failure of said first link,
~~disable~~ identify said second port of said primary network
element ~~coupled to said second link in response~~
~~to detection of said failure of said first link that is~~
associated with said virtual network, and
disable said second port of said primary network
element,
re-enable said second port of said primary network element
coupled to said second link in response to detection of a
recovery of said first link; and
said redundantly-linked endstation, wherein
said redundantly-linked endstation is configured to fail back to said
communications channel comprising said second link in response
to re-enabled said second port, and
said primary network device is configured to fail back to said
communications channel comprising said first link, in response to
re-enabled said second port.

39. (Previously Presented) The data processing system of claim 38 further comprising:

a secondary network element, wherein
said secondary network element is coupled to said redundantly-linked
endstation using a third link,
said redundantly-linked endstation is configured to enable said third link,
in response to disabled said second port,

said secondary network element is coupled to said upstream portion of said communications network using a fourth link, and said redundantly-linked endstation is configured to fail over to another communications channel comprising said third link and said fourth link, in response to disabled said second port.

40. (Original) The data processing system of claim 38, wherein said primary network element comprises an Ethernet switch.
41. (Previously Presented) The method of claim 1, wherein said second link is predetermined, using a configuration interface, to be automatically disabled in response to said detecting said failure of said first link.
42. (Currently Amended) The **apparatus network element** of claim 15, wherein said second link is predetermined, using a configuration interface, to be automatically disabled in response to said detecting said failure of said first **link**.
43. (Currently Amended) The machine-readable non-transitory storage medium of claim 25, wherein said second link is predetermined, using a configuration interface, to be automatically disabled in response to said detecting said failure of said first **link**.
44. (Currently Amended) The data processing system of claim 35, wherein said second link is predetermined, using a configuration interface, to be automatically disabled in response to said detecting said failure of said first **link**.
45. (Currently Amended) The data processing system of claim 38, wherein said second link is predetermined, using a configuration interface, to be automatically disabled in response to said detecting said failure of said first **link**.
- 46.-50. (Cancelled)

51. (Previously Presented) The method of claim 1, wherein said disabling said second port further comprises:
- determining, on-demand upon said detecting said failure of said first link, that said second port should be disabled, in response to analyzing a plurality of system attributes.
52. (Currently Amended) The **apparatus network element** of claim 15, wherein said ~~means for disabling said second port~~ **link failure propagation module is** further ~~comprises: means for determining~~ **configured to determine**, on-demand upon ~~said means for detecting~~ **detection of** said failure of said first link, that said second port should be disabled, in response to analyzing a plurality of system attributes.
53. (Previously Presented) The machine-readable non-transitory storage medium of claim 25, wherein said disabling said second port further comprises:
- determining, on-demand upon said detecting said failure of said first link, that said second port should be disabled, in response to analyzing a plurality of system attributes.
54. (Previously Presented) The data processing system of claim 35, wherein said network element is further configured to:
- determine, on-demand upon detection of said failure of said first link, that said second port should be disabled, in response to an analysis of a plurality of system attributes.
55. (Previously Presented) The data processing system of claim 38, wherein said primary network element is further configured to:
- determine, on-demand upon detection of said failure of said first link, that the second port should be disabled, in response to an analysis of a plurality of system attributes.

56. (Previously Presented) The method of claim 2, further comprising:
said redundantly-linked network element failing back to said second link when
said first link and said second link become operational again.
57. (Currently Amended) The ~~apparatus~~ network element of claim 16, wherein
said link failure propagation module is further ~~comprising: means for failing~~
configured to fail back said redundantly-linked network element to said second link
when said first link and said second link become operational again.
58. (Previously Presented) The machine-readable storage medium of claim 26,
wherein said method further comprises:
said redundantly-linked network element failing back to said second link when
said first link and said second link become operational again.
59. (Previously Presented) The data processing system of claim 35, wherein said
redundantly-linked endstation is configured to fail back to said second link when said
first link and said second link become operational again.
60. (Previously Presented) The data processing system of claim 38, wherein said
redundantly-linked endstation is configured to fail back to said second link when said
first link and said second link become operational again.
61. (Currently Amended) The method of claim 1, wherein
said detecting said failure of said first link further comprises
detecting a bandwidth of the first link falling below a predetermined
threshold[[:]] .
~~said first link is associated with a virtual network;~~
~~said second link is associated with said virtual network; and~~
~~said second port of said network element is disabled as a result of~~
~~said second port being associated with said virtual network, and~~
said failure of said first link.

62. (Currently Amended) The **apparatus network element** of claim 15, wherein ~~said means for detecting~~ said **link** failure ~~of said first link propagation module~~ **is** further ~~comprises means for detecting configured to detect~~ a bandwidth of the first link falling below a predetermined threshold[[]] .
~~said first link is associated with a virtual network;~~
~~said second link is associated with said virtual network; and~~
~~said second port of said network element is disabled as a result of~~
~~said second port being associated with said virtual network, and~~
~~said failure of the first link.~~
63. (Currently Amended) The machine-readable non-transitory storage medium of claim 25, wherein
 said detecting said failure of said first link further comprises
 detecting a bandwidth of the first link falling below a predetermined threshold[[]] .
~~said first link is associated with a virtual network;~~
~~said second link is associated with said virtual network; and~~
~~said second port of said network element is disabled as a result of~~
~~said second port being associated with said virtual network, and~~
~~said failure of the first link.~~
64. (Currently Amended) The data processing system of claim 35, wherein
 said network element is further configured to
 detect a bandwidth of the first link falling below a predetermined threshold as detection of said failure of said first link[[]] .
~~said first link is associated with a virtual network;~~
~~said second link is associated with said virtual network;~~
~~said second port of said network element is disabled as a result of~~
~~said second port being associated with said virtual network, and~~
~~said failure of the first link.~~

65. (Currently Amended) The data processing system of claim 38, wherein said network element is further configured to
- detect a bandwidth of the first link falling below a predetermined threshold as detection of said failure of said first link[[]] ;
- ~~said first link is associated with a virtual network;~~
- ~~said second link is associated with said virtual network; and~~
- ~~said second port of said primary network element is disabled as a result of~~
- ~~said second port being associated with said virtual network, and~~
- ~~said failure of the first link.~~
66. (Previously Presented) The method of claim 1, wherein said second port of said network element is directly connected to said second link between said network element and said downstream portion of said communications network.